

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1. (Currently Amended) A cyclotron ~~Cyclotron~~ (1) intended for the acceleration of a charged particle beam (46) circulating in a the median plane (40), essentially being in the form of two poles inducing a magnetic field and having an ~~[[a]] so-called~~ axial injector (100), i.e. ~~an injector~~ located on the outside of the cyclotron, essentially in accordance with the main axis (22) of the cyclotron, and so perpendicularly to the median plane of the same, and which is combined with inflection means (30 or 40) ~~which make it possible~~ to inflect the particle beam until it is positioned in the median plane, ~~characterized in that~~ wherein the inflection means are made up of a magnetic inflector, and wherein the inflection means provide the magnetic field with a horizontal or radial component at the level of the center of the cyclotron, thus making it possible to guide the charged particle beam in such a way that it progressively inflects toward the median plane.

2. (Cancelled)

3. (Currently Amended) The cyclotron ~~Cyclotron~~ according to claim 1 wherein the inflection means are made up of ferro-magnetic elements (31 and 33), ~~preferably~~ integrated with the two poles.

4. (Currently Amended) The cyclotron ~~Cyclotron~~ according to claim 3, wherein ~~the said~~ inflection means comprise a first element in the form of a cone (31), and a second element in the form of a ring (33) surrounding a section of the said cone.

5. (Currently Amended) The cyclotron ~~Cyclotron~~ according to claim 4, wherein ~~in which~~ the axes of symmetry of the ~~said~~ elements coincide with the axis of symmetry of the cyclotron.

6. (Currently Amended) The cyclotron ~~Cyclotron~~ according to claim 3, wherein ~~it also~~ the cyclotron further comprises, upstream from the inflection means, guiding elements (28) for the ~~said~~ beam.

7. (Currently Amended) The cyclotron ~~Cyclotron~~ according to claim 1 wherein the inflection means are made up of rings or washers (40) assembled from individual elements which are permanent magnets.

8. (Currently Amended) The cyclotron ~~Cyclotron~~ according to claim 7, ~~in which the said~~ wherein the permanent magnets are made from an alloy ~~such as a selected from the group consisting of samarium-cobalt and~~ ~~or~~ neodymium-iron-boron alloy.

9. (Currently Amended) The cyclotron ~~Cyclotron~~ according to claim 8, ~~in which the said~~ wherein the inflection means are made up of a series of rings of which the central points form a trajectory in the form of a spiral helix.

10. (New) A cyclotron for the acceleration of a charged particle beam circulating in a median plane, essentially being in the form of two poles inducing a magnetic field and having an axial injector located on the outside of the cyclotron, essentially in accordance with the main axis of the cyclotron, and so perpendicularly to the median plane of the same, and which is combined with a magnetic inflector to inflect the particle beam until it is positioned in the median plane, wherein the magnetic inflector provides the magnetic field with a horizontal or radial component at the level of the center of the cyclotron, thus making it possible to guide the charged particle beam in such a way that it progressively inflects toward the median plane.

11. (New) The cyclotron according to claim 10, wherein the magnetic inflector comprises ferro-magnetic elements integrated with the two poles.

12. (New) The cyclotron according to claim 10, wherein the magnetic inflector comprises a first element in the form of a cone and a second element in the form of a ring surrounding a section of the said cone.

13. (New) A cyclotron for the acceleration of a charged particle beam circulating in a median plane, essentially being in the form of two poles inducing a magnetic field and having an axial injector located on the outside of the cyclotron, essentially in accordance with the main axis of the cyclotron, and so perpendicularly to the median plane of the same, and which is combined with inflection means to inflect the particle beam until it is positioned in the median plane, wherein the inflection means are made up of a magnetic inflector.

14. (New) The cyclotron according to claim 13, wherein the inflection means provide the magnetic field with a horizontal or radial component at the level of the center of the cyclotron, thus making it possible to guide the charged particle beam in such a way that it progressively inflects towards the median plane.

15. (New) The cyclotron according to claim 13, wherein the inflection means are made up of ferro-magnetic elements integrated with the two poles.

16. (New) The cyclotron according to claim 13, wherein the inflection means comprise a first element in the form of a cone and a second element in the form of a ring surrounding a section of the said cone.

17. (New) The cyclotron according to claim 13, wherein the cyclotron further comprises, upstream from the inflection means, guiding elements for the beam.

18. (New) The cyclotron according to claim 13, wherein the inflection means comprise rings or washers assembled from individual elements which are permanent magnets.

19. (New) The cyclotron according to claim 13, wherein the inflection means comprise a series of rings of which the central points form a trajectory in the form of a spiral helix.

20. (New) A cyclotron for the acceleration of a charged particle beam circulating in a median plane, essentially being in the form of two poles inducing a magnetic field and having an axial injector located on the outside of the cyclotron, essentially in accordance with the main axis of the cyclotron, and so perpendicularly to the median plane of the same, and which is combined with a magnetic inflector to inflect the particle beam until it is positioned in the median plane.

21. (New) The cyclotron according to claim 20, wherein the magnetic inflector comprises of ferro-magnetic elements integrated with the two poles.